

On the twenty-fifth day the vesicles were larger. On the twenty-sixth day they were of the size of a lentil; the envelope began to be formed and the first traces of heads appeared.

On the thirtieth day, the heads, under the form of tubercles, were visible to the naked eye. On the thirty-eighth day the eminences appeared more distinctly on the surface, and the heads exhibited signs of their suckers and hooks. Towards the forty-fifth day the *Cœnuri* were of the size of a bean, and the cavities in which the heads are lodged were formed.

Besides the brain, the heart, the œsophagus, and the diaphragm of some of the lambs also contained encysted vesicles; but these are not the *Cysticercus tenuicollis*, as I was at first inclined to think with M. Leuckart,—they are strayed and aborted worms.

The following is the result to which my researches have led:—The adult *Cœnuri* live and become developed in the intestine of the dog, forming the *Tænia cœnurus*, which has hitherto been confounded with the *Tænia serrata*.

The malady known as the *turn-sick*, *staggers* or *vertigo* is propagated in the following manner:—The shepherds cut off the heads of the sheep affected with this disease and throw them to the dogs, which swallow the *Cœnuri* along with the brain, and these *Cœnuri* give rise to *Tænia*s in their intestines. As the *Cœnuri* sometimes bear as many as 300 heads, and each head (*scolex*) can produce a *Tænia*, it will be easily imagined that these worms must multiply with great rapidity.

The dogs following the sheep in the meadows, pass the proglottides filled with eggs along with their excrements; and these eggs are thus scattered over the herbage upon which the sheep feed.

Moist meadows are most favourable to the development of the malady, as the proglottides and eggs dry there more slowly.—*Bull. de l'Acad. Royale de Belgique*, 1854, p. 306.

On the Occurrence of Zinc in the Vegetable Organism.

By A. BRAUN.

It is well known that the calamine hills of Rhenish Prussia and the neighbouring parts of Belgium possess a peculiar flora; visitors to these regions are particularly surprised by a species of violet allied to *Viola tricolor*, which unfolds its beautiful yellow flowers in uninterrupted profusion from spring until the end of autumn, and is known in the neighbourhood of Aix as the Calamine violet, or in the dialect of the district “Kelmesveilchen.” This plant has been described by Lejeune in his “Revue de la Flore de Spaa” as a distinct species under the name of *Viola calaminaria*, but he has since characterized it (*Comp. Floræ Belgicæ*) as *Viola lutea*, Smith. Koch and other authors have also rightly considered it as a variety of *V. lutea*, Smith (*grandiflora*, Huds.), a species principally distinguished from *V. tricolor* by its filiform subterraneous runners, by means of which it survives the winter. In its habits it is remarkably distinct from the ordinary *Viola lutea* of the Alps, as well as from

the form of this plant occurring on the higher Vosges on granitic and syenitic soils (described by Spach as *Viola elegans*); its stem being more procumbent and repeatedly branched at the base, and the flowers being generally smaller. I will not, however, express any further opinion as to whether this violet may or may not be a distinct species, for the violets of the same group as *V. tricolor* present so many difficulties to systematic botanists in consequence of their extraordinary variability, that it is difficult to find the middle course between the union of them all under one name, and the establishment of a multitude of species. Many other plants grow in company with the *Viola calaminaria*, which, although in this district peculiar to the calamine hills, nevertheless grow in other localities in soil free from calamine.

The colour of the flowers of the *Viola lutea* of the Alps and Vosges varies from the darkest violet to the purest yellow, whilst the flowers of *V. calaminaria*, at least in the neighbourhood of Aix, are almost always yellow. On the borders of the calamine district specimens are met with here and there with pale violet, or bluish, or mixed blue and yellow flowers, which have been regarded by Kaltenbach as hybrids between this plant and the *V. tricolor*, which certainly occur on cultivated land in the neighbourhood. But I have also seen a specimen of the true *V. calaminaria* from the calamine region of Westphalia which is of a dark violet colour. The plant when cultivated in gardens is said to change and become like the common *V. tricolor*.

The connexion between the occurrence of the *V. calaminaria* and the presence of calamine in the soil, which is so constant that even mining experiments have been undertaken with good results from the indications furnished by this plant, induced me, when in Aix, to urge M. Victor Monheim of that place, to examine the plant especially with reference to its containing zinc. He afterwards sent me the following account of a chemical investigation of the plant, performed in his laboratory and under his eye, by M. F. Bellingrodt, which I give in the latter gentleman's own words:—

“The plants, some of which were still in flower, were collected in the month of October on the Altenberg and in the immediate neighbourhood of its large zinc works. To get rid of adhering earth completely, the fresh, uncut herbage with the roots was washed with water, until, when macerated for sixteen or eighteen hours with water containing muriatic acid, it gave no inorganic matter to the dilute acid. The whole was then finely chopped and digested on the vapour-bath for twelve hours with water and muriatic acid; the vegetable matter was separated from the extract, and this treated with chlorate of potash. The addition of an excess of ammonia to the decolorized extract, now produced a precipitation of alumina, organic substances, and partially of the iron.

“The precipitate produced in the filtrate by sulphuret of ammonium was dissolved in muriatic acid, oxidized by nitric acid, and the iron then completely separated by ammonia. A portion of the

filtered fluid was boiled with solution of potash, when traces of manganese were precipitated. Solution of sulphuretted hydrogen then rendered the presence of zinc in the filtrate quite evident.

“Another portion of the fluid filtered from the iron precipitate was precipitated at once by sulphuret of ammonium, the dried precipitate calcined in a platinum crucible, moistened with nitric acid, again calcined, and then treated with dilute acetic acid; the zinc was precipitated from the solution in acetic acid by solution of sulphuretted hydrogen.

“From another portion of the herb, freed from external impurities, the juice was expressed, and the presence of zinc in this was also distinctly proved by the above process.”

This metal must therefore be added to the eighteen elements hitherto known to occur in the vegetable organism.—Poggendorff's *Annalen*, vol. xcii. p. 175.

Notes on the Bovine Animals of the Malay Peninsula.

By GEORGE WINDSOR EARL.

1. The Sapi, or Wild Ox of the Malay Peninsula, was scarcely known to exist until 1850, when Dr. Oxley, and a hunting-party from Singapore, killed a young cow on the banks of the Muah River. He described it as 6 feet 2 inches high at the shoulder, from hoof to dorsal vertebræ; back curved, highest about the centre. Horns small, curved inwards, white, tipped with black. Forehead flat, with tuft of long hair, large in the bulls. Hair smooth and silky. Colour brown, with white about the feet. Mane 2 inches long, running along the entire back. No dewlap. The bulls are from 7 to 7½ feet high. The flesh is described as delicious. Calves could be obtained with a little trouble, but I suspect it would be difficult to get a full-grown animal; but he would be worth something if caught.

2. The Saladang, another species of wild cattle, is even less known than the Sapi, as no specimen has yet been shot by Europeans. It seems to me to be a sort of Bison, or *Bos Gaurus*. The males are 10 feet high at the shoulder, and they are altogether fiercer and more formidable than the Sapi, but not so graceful. In my opinion it would be worth while for the Zoological Society to send a man out expressly for the purpose of bringing home specimens of these two beasts. The Muah River, where both varieties abound, would be the best spot to seek them; and Inchi Basow, a Malay chief who takes great delight in hunting, would soon procure live specimens of each at a small expense.

3. The Water Buffalo does not seem to be known in England, although it is common all over the Archipelago. The larger specimens stand 7 feet at the shoulder, sometimes more. Barrel very large. Legs short and strong. Skin black and wrinkled, and almost hairless, like that of the Elephant. It is amphibious, and has been known to swim across straits as wide as the Channel at Dover; in fact, the way the head is set on the body, with the nose up, and the